

WHAT IS CLAIMED IS:

1. A method for detecting signals comprising:
reading a set of search parameters;
generating a group of hypotheses from the set of search parameters;
assigning each hypothesis from the group to a correlator;
5 correlating a pseudo-random number (PN) sequence generated from each hypothesis
against a received sequence;
accumulating the correlation result; and
processing the accumulation result.
2. The method of claim 1, wherein the set of search parameters is stored in a record
10 memory.
3. The method of claim 2, wherein there are a plurality of sets of search parameters stored in
the record memory, and wherein each set of search parameters is assigned a reference number.
4. The method of claim 3, wherein there is a result memory, and wherein results from the
processing are stored in the result memory with the same reference number as the set of search
15 parameters.
5. The method of claim 1 further comprising prior to the reading:
determining availability of storage space; and
writing the set of search parameters by a control unit if storage space is available.
6. The method of claim 5 further comprising repeating the determining and the writing until
20 storage space is no longer available or all sets of search parameters have been written.

7. The method of claim 1 wherein the assigning comprises:

assigning each hypothesis from the group to a correlator if there are as many idle correlators as there are hypotheses in the group; and

5 assigning as many hypotheses as there are idle correlators, wherein each hypothesis is assigned to a correlator, if there are fewer idle correlators than hypotheses.

8. The method of claim 1, wherein there are a plurality of sets of search parameters, and wherein the assigning comprises:

determining if there are a sufficient number of correlators; and

10 repeating the reading, generating, and assigning with a different set of search parameters if there is an insufficient number of correlators.

9. The method of claim 1 further comprising repeating the reading, generating, and assigning as long as there are idle correlators.

10. The method of claim 1 further comprising storing the results from the processing.

11. The method of claim 10, wherein the set of search parameters is assigned a reference
15 number, and wherein the results of the processing is stored using the same reference number as the set of search parameters.

12. The method of claim 1, wherein the set of search parameters specifies a single hypothesis, and wherein the group of hypotheses contains the single hypothesis.

13. A circuit comprising:

a memory to store sets of search parameters and search results, wherein each set of search parameters is assigned a reference number, and a set of search results for a set of search parameters is stored with the same reference number;

5 a searcher coupled to the memory, the searcher containing circuitry to read a set of search parameters from the memory, process pseudo-random number (PN) sequences generated based the set of search parameters with a received sequence, and write the correlation results to a set of search results with the reference number of the set of search parameters; and

a sequence generator coupled to the searcher, the sequence generator containing circuitry
10 to generate a PN sequence from each hypothesis provided to it by the searcher.

14. The circuit of claim 13, wherein the memory further comprises:

a common parameter storage space to store search parameters common to each set of search parameters currently in the memory; and

a common result storage space to store search results common to each search result
15 currently in the memory.

15. The circuit of claim 13 further comprising:

a hypothesis generator coupled to the memory and the search engine, the hypothesis generator containing circuitry to generate hypotheses from the set of search parameters and from a timing reference provided by the searcher; and

20 a result processor coupled to the search engine and the memory, the result processor containing circuitry to compare the set of search results against a specified threshold.

16. The circuit of claim 13, wherein the searcher comprises:

a plurality of correlators to correlate a received sequence with each of the generated PN sequences;

a control memory to store control information for use in the processing of the generated

5 PN sequences; and

a scratch memory to store temporary results during the processing.

17. The circuit of claim 16, wherein the control memory and the scratch memory are partitioned into a plurality of storage spaces, and wherein there is a control memory storage space and a scratch memory storage space for each correlator.

10 18. The circuit of claim 13, wherein the memory can store eight (8) sets of search parameters, eight (8) sets of search results, and wherein the searcher has 256 correlators.

19. A wireless device comprising:

an analog front end coupled to an antenna, the analog front end containing circuitry to filter and amplify a received signal provided by the antenna;

an analog-to-digital converter (ADC), the ADC to convert an analog signal provided by
5 the analog front end into a digital symbol stream; and

a processing unit coupled to the ADC, the processing unit containing circuitry to store sets of search parameters and search results, test hypotheses derived from the sets of search parameters.

20. The wireless device of claim 19, wherein the processing unit comprises:

10 a memory to store sets of search parameters and search results, wherein each set of search parameters is assigned a reference number, and a set of search results for a set of search parameters is stored with the same reference number;

a controller coupled to the memory, the controller to write sets of search parameters to the memory and retrieve sets of search results from the memory; and

15 a searcher coupled to the memory and the controller, the searcher containing circuitry to read a set of search parameters from the memory, create hypotheses from the set of search parameters, correlate the hypotheses with a received sequence, and write the correlation results to a set of search results with the reference number of the set of search parameters.

21. The wireless device of claim 20, wherein the memory further comprises:

20 a common parameter storage space to store search parameters common to each set of search parameters currently in the memory; and

a common result storage space to store search results common to each search result currently in the memory.

22. The wireless device of claim 20, wherein the searcher comprises a plurality of correlators, wherein a set of search parameters can result in a plurality of hypotheses, and wherein each hypothesis from the plurality of hypotheses is assigned to a unique correlator.

23. The wireless device of claim 22, wherein each assigned correlator correlates a pseudo-
5 random number (PN) sequence generated from its hypothesis with a received sequence.

24. The wireless device of claim 23, wherein each assigned correlator correlates with the same received sequence.

25. The wireless device of claim 20, wherein the controller also specifies when the searcher may assert an interrupt to notify the controller that the searcher has completed processing an
10 assigned search.

26. The wireless device of claim 19, wherein the wireless device operates in a digital communications network.

27. The wireless device of claim 26, wherein the digital communications network is a direct sequence spread spectrum communications network.

15 28. The wireless device of claim 27, wherein the digital communications network is a CDMA2000 compliant communications network.

29. The wireless device of claim 27, wherein the digital communications network is a Universal Mobile Telephony System (UMTS) compliant communications network.

30. The wireless device of claim 26, wherein the wireless device is capable of operating in a
20 plurality of digital communications networks.